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REVIEW

Some reflections on an appraisal of behavioral price research (part 1)

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Abstract The authors reflect on the commentators' comments and add some additional thoughts about the current state of behavioral price research.

Keywords Behavioral price research · Price information processing · Emotional side of price · Differential price threshold

When we started to review and assess the research domain previously referred to as behavioral pricing research, little did we realize the actual scope, extent and significance of this research area since its beginning. While Kent has been involved in behavioral price research for more years than he admits, and has contributed to its expanding reach, nevertheless it became clear early on that it would take multiple essays to review and assess this research domain. As the commentators have observed, there is still a need for much more research to understand how people perceive and respond to prices and price information. At the outset of this reflection, we reiterate that the concept of buyers' behavioral responses to *price* really is the core of this field of research.

While it may seem a trivial point to some, we want to affirm that the research area in question should be called behavioral “price” research because at the core of the research is the variable of “price” and not a study of “pricing” as a practice. Moreover, although psychology remains one major part of the research domain, it is broader than price psychology (Thomas 2013). There are also cultural, sociological, as well as economic aspects to the underlying issue of how

people perceive, process and respond to price information (Rao 2013). Consequently, labeling this area of inquiry as behavioral price research is more inclusive and accurate.

Why should one take the time and effort to review and appraise an area of research? In a nutshell, it is less about determining what we may know about the underlying area of interest but rather, as the commentators indicate, it is more about documenting what we do not know and thereby, hopefully guide future research efforts. In most areas of inquiry, knowledge grows by bits and pieces, and generally, in a somewhat haphazard way. Individual research efforts, though relatively small in the overall scheme of things, nevertheless can have a large cumulative effect. Unfortunately, researchers are not rewarded well, either by their peers or institutions, to integrate a disparate set of research efforts within a research domain. Sadly, in marketing, the documenting of what we know and do not know is infrequently accomplished. As the commentators note, previous reviews such as that by Monroe (1973) and Monroe and Lee (1999) have spurred additional research on issues related to how price information influences buyer behavior. It is in this vein that we aim to push the frontier in behavioral price research.

In this first of a planned series of appraisals, beyond documenting what we do and do not know, we clarify some misconceptions, offer new insights, and provide explicit definitions of the four fundamental core concepts behind how people perceive, process and respond to price information. By focusing on “price as a stimulus,” not only do we highlight the historical basis of this research domain but also the inception of our query into how prices influence buyer behavior. Even with a focus only on price as a stimulus, we are reminded that there is a vast number of issues that behavioral price research has yet to explore. It is important to note that given the complexity of the singular subject of price as a stimulus, we did not intend to be exhaustive. Rather, we have sought to question the current and excite future research. We hope that this endeavor will spur more research efforts that will help us understand better the

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multidimensional ways in which people respond to prices and price information.

Some research issues

Lee (2013) succinctly identifies five key principles from this first essay. The commentators identify some important issues relative to this initial appraisal that deserve careful thought. They suggest that behavioral price research would benefit by: (1) taking a stronger information processing approach emphasizing the role of deliberative vs. non-deliberative processes (Adaval 2013); (2) studying the relative ease or difficulty that price information is perceived and processed (Rao 2013); (3) examining the role of heuristics (Thomas 2013); and (4) exploring how people form magnitude perceptions (Adaval 2013; Coulter 2013; Lee 2013; Rao 2013). Similarly, there is an exhortation for more research related to how emotions and feelings influence people's judgments and decisions (Adaval 2013; Lee 2013; Rao 2013; Thomas 2013) and how the senses of smell, taste and touch influence people's perceptions of price information, how the information is processed, and eventually the outcome attributed to decisions and choices (Coulter 2013; Rao 2013). Rather than "an afterthought," we had intended our statement "the emotional side of price ... has received little attention in research" (Cheng and Monroe 2013) as an emphatic plea for more research on the emotional side of price.

Cognition, heuristics and emotions

An important contribution stemming from behavioral price research is the recognition that it is buyers' perceptions that underlie how they respond to price information (Monroe 1973). Economic models suggest "price not only influences buyers' expectations but also influences producers' incentives" (Klein and Leffler 1981, p. 614). Unlike a behavioral approach, the economic approach does not invoke a uninformed consumer making irrational or sub-optimal decisions. Rather, there is an assumption of a utility-maximizing consumer dealing with a profit-maximizing firm (Rao 2013; Stiglitz 2012). As Simon (1989, p. 377) wondered: "How do human beings reason when the conditions for rationality postulated by the model of neoclassical economics are not met?"

Behavioral price research offers explanations of how people perceive price information, form value judgments and make decisions when they do not have perfect information about alternative choices. These explanations help us understand why buyers may be more sensitive to price increases than to price decreases, or how they respond to comparative price advertisements, coupons, rebates, and other price promotions. The underlying premise for these responses is that

buyers judge prices comparatively, or that a *reference price* anchors their judgments. A reference price is a dynamic, internal price to which an individual compares the offered price of a product or service (Cheng and Monroe 2013). It may be an internal price the buyer may remember from a previous purchase, an expected price, a belief about what would be a fair price for the product in the same market area, or perhaps some vague notion of what the product might be worth. Moreover, a reference price is always manifested as a level (Cheng and Monroe 2013) and buyers may not know consciously that a reference price is actually in their mind as these judgments occur.

People seldom are good information processors and they often take shortcuts (use decision heuristics) consciously and non-consciously (Darke et al. 1995; Thomas and Morwitz 2009; Thomas 2013). "A heuristic is a strategy that ignores part of the information, with the goal of making decisions more quickly, frugally, and/or accurately than more complex methods" (Gigerenzer and Gaissmaier 2011, p. 454). Such a shortcut, while facilitating the choice process, actually may be more likely to maximize value than a deliberate scrutiny of all alternatives. It can be conscious as well as non-conscious, can be defined as a rule, and can be more accurate than so-called optimizing strategies (Gigerenzer and Gaissmaier 2011).

But are all apparently non-deliberative decisions the result of a heuristic? Is it not likely that there are other reasonable explanations for when individuals respond to stimuli to situations in less than a "rational" way? We should be careful about developing a list of "heuristics" or decision short cuts based on single studies (i.e., the $n=1$ problem (Wells 2001)). To illustrate, Thomas (2013) cites the "frequency of discounts" heuristic based on research reported by Alba et al. (1994, 1999). In that research, pitting one store that infrequently used relatively large discounts (discount magnitude) against another store that frequently used small discounts (discount frequency) over 36 trials, respondents judged the frequently discounted store as having overall lower prices.

Lalwani and Monroe (2005) first replicated that experiment and got very similar effects. In a second study, simply multiplying the experimental prices by 100 (meaning the variance of the price stimuli was invariant), they reversed the results as the respondents then judged the infrequent discounting store (discount magnitude) to have lower prices overall. Their explanation for the reversal of these results was the perceived relative salience of discount frequency in the initial study. But with larger monetary differences between prices in the second study, it was the perceived salience of the discount magnitudes that influenced participants' judgments.

Rather than exploring a laundry list of idiosyncratic heuristics in behavioral price research, or more generally, in consumer research, we need more comparative tests of alternative explanations for the suspected heuristics. Such careful

research efforts will help to ascertain the ecological validity of these heuristics. This prescription means we need to do more strong tests and not use the null hypothesis as the “straw man.”

Evaluations of products may depend on different types of information or knowledge: (a) declarative information (i.e., features, facts, and benefits) and (b) experiential information (emotions and experiences evoked by the product or service) (Esch et al. 2012). The judgments thus formed with the information or knowledge involve both conscious feelings toward the product/service as well as non-conscious affective influences (Slovic et al. 2007). Feelings are an essential source of information (Schwarz and Clore 1988; Thomas and Menon 2007).

Knowledge is the dynamic accumulation of personal assimilation and interpretation of data and contextual information received through the senses from experiences. It is a basis for evaluating and incorporating new experiences and information. All knowledge is personal and that is why we have stipulated that the four fundamental concepts discussed in the appraisal be defined at the individual person level. Through learning and experience, these products and services become “marked” by associations that are expressed through emotions and feelings (Bechara and Damasio 2005).

Behavioral researchers from multiple perspectives agree that the initial response to any environment is affective (positive and negative), and that the images marked by these feelings guide subsequent customer judgments and decisions within that environment (Davidson 2004; Lehrer 2009; Machleit and Eroglu 2000; Slovic et al. 2007). Thus, it is difficult to imagine a situation where “the emotional content of numerical information is generally sterile or predictable ...” (Rao 2013). Yes, most people can judge that one number (offer price) is more or less than another number (internal reference price), but this judgment does not mean that a perception of the relative expensiveness of the product has been formed (differential price perceptual threshold reached) or that it precludes an affective response. For example, individuals may become upset if the offer price exceeds their reference price, or if other buyers pay less than they do. Conversely, people may become elated if the offer price is less than their reference price. We should also not presume that buyers always notice a price change or that they prefer lower prices. These are research issues that have not been extensively studied and will be reviewed in our next essay.

An information processing approach

Can these seemingly myriad suggestions for future behavioral price research be integrated in a single perspective? To illustrate, we offer the figure below. This figure is an augmented stimulus–response model indicating the process begins with an initial exposure to price information and demonstrates the process we describe in the essay. Briefly, the manner in which price information is initially presented to buyers will influence their psychological, physiological, and emotional reactions inducing sensations (Adaval 2013; Coulter 2013). Individuals must interpret (construe) these sensations, leading to their perceptions of the information. This process of *interpretation* may or may not involve cognitive deliberation. We are reminded that our reactions are always subject to our interpretation of the environment within a *system of beliefs* that we assimilate through personal experiences (Fig. 1).

Central to studying price information processing is to understand how people encode and represent price and price-related information in their minds. Coulter (2013) and Rao (2013) highlight this issue as we do in our first appraisal. The important price memory research area may have led to some mistaken conclusions about whether people can or do remember prices of items that they have purchased (Monroe and Lee 1999). Previous price memory research assumes that the Arabic numerals would be encoded and represented in buyers’ minds exactly in symbolic form. When buyers do not recall the actual symbols accurately, researchers have inferred that the buyers have not attended to price information when making their choices. We indicate in this first essay that such inferences perhaps are not warranted because buyers may encode and *represent* the price information in memory as approximations (e.g. less than \$100) or as evaluations (e.g., not expensive). Also, working memory capacity is limited and information decays within 2–3 s unless it is rehearsed (Baddeley 2000; Vanhuele et al. 2006). Simply, recall is an inadequate measure of how fluent recently encountered price information may be in a buyer’s memory (Mazumdar and Monroe 1990, 1992; Monroe and Lee 1999; Thomas 2013).

Buyers compare prices, make calculations and estimates when evaluating options and making choices. Research indicates that they may not always handle these tasks effortlessly or

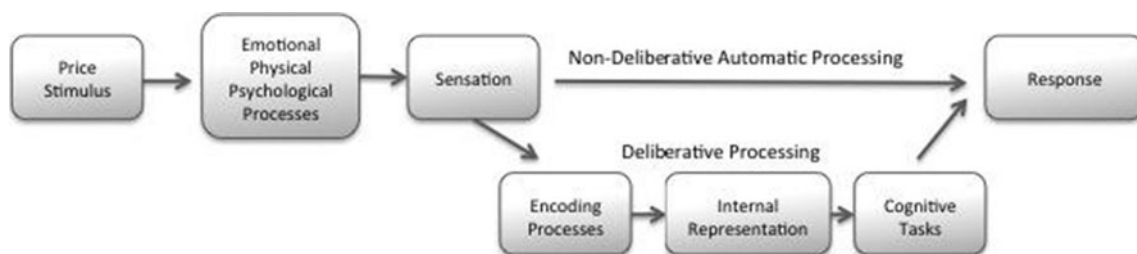


Fig. 1 A process model of behavioral response to price stimulus

accurately (Chen and Rao 2007). Moreover, studies indicate that people have difficulty making calculations relative to everyday living and that they often avoid doing so, at times choosing a heuristic to simplify their task (Suri et al. 2013; Thomas 2013). Buyers also may simply make a purchase choice reactively (or emotionally) without deliberation.

Relating the two price differential thresholds

Lee (2013) notes the seemingly non-intuitive implications stemming from Eq. (10) in Cheng and Monroe (2013).

$$K = \Delta I / P_{ref} = \Delta D / P_{ref} - \Delta D \quad (10)$$

where K is the constant of proportionality,

P_{ref} is the individual's reference price

ΔI is the increase in price, and

ΔD is the decrease in price.

Having studied the translations of the original writings of Bernoulli, Weber and Fechner, it is clear that only Bernoulli gave any discussion to decrements. The experiments of Weber and the subsequent mathematical formulations by Fechner were only concerned with increments. Their response functions, however, were concave in nature illustrating a logarithmic relationship where the change in magnitude of a stimulus needs to be greater as the stimulus gets more intense for an individual to notice there is a difference (just noticeable difference). Conversely, given the concavity of the function, it is clear from mere observation that to reach the point of just noticeable difference (or a threshold), the change in magnitude of a stimulus must shrink as the stimulus intensity becomes less intense.

Prospect theory (Kahneman and Tversky 1979), having originally developed from adaptation-level theory, postulates that the response function is concave for gains (above the reference point) and convex for losses (below the reference point). The authors specifically pointed out that this S-shaped value function is steepest at the reference point. A loss in wealth is, therefore, generally valued more negatively than an increase in wealth of the same absolute magnitude would be valued positively. Hence, we have the popular belief that “losses loom larger than gains.”

In the realm of prices and price changes, an increase in price would be considered a loss whereas a price reduction would be considered a gain. If individuals are generally more sensitive to losses than to gains, then people would react more readily to price increases than to price reductions of the same magnitude.

As Eq. (10) shows, it takes a smaller absolute amount of decrease in a price to induce a differential price *perceptual* threshold than a price increase. Yet, prospect theory implies that given the same magnitude of change, people would

respond to a price increase faster than to a price decrease. This point brings us to the contention in Cheng and Monroe (2013) that “at the minimum, a consumer would only respond to a price decrease at the second differential price perceptual threshold of a decrease”. This difference in response arises because a buyer would respond faster to the differential price *perceptual* threshold for a price increase (thereby making it a differential price *response* threshold also). For price decreases, therefore, more than one differential price perceptual threshold must be crossed before a differential price *response* threshold is reached.

It is important to recognize that there are two kinds of differential price thresholds, perceptual and response. Disentangling them theoretically, methodologically, and substantively is essential in understanding how price changes affect buyer behavior.

Conclusion

We are gratified by the thoughtful remarks of the commentators. Their valuable points enrich this appraisal and further our efforts in raising more questions in and bringing more attention to the area of behavioral price research. The journey that we have embarked on to appraise behavioral price research has become an exciting and rewarding endeavor. This appraisal is an extensive review, but it is neither exhaustive of all relevant research on these four concepts, nor of behavioral price research itself. In future essays, we will continue this odyssey and visit other important behavioral price research areas.

Of particular interest is the “ubiquitous logarithmic curve.” In Cheng and Monroe (2013), we introduced the concepts of two different kinds of differential price thresholds that we have further explored in the previous section. We also mentioned people's innate logarithmic mental number line. Thus, there is an additional threshold concept of research interest: the number discrimination threshold or when two numbers are noticeably different. We will return to this thought in the future.

While research on the reference price concept has been a focus of considerable research efforts, inquiries relative to the price-perceived quality relationship have been more numerous (Somervuori 2012). Taking a quasi-historical approach in our next essay, we will appraise these efforts and document how research has morphed into queries about perceptions of value and choice.

As noted by Rao (2013), managers primarily still subscribe to the microeconomic theory of the firm when determining prices. The knowledge about how people perceive, process and respond to prices and price information that behavioral price research has produced has not been commonly applied into practice. The four concepts that we emphasize in this essay have not been embraced in pricing management despite the strong evidence that the microeconomic-based approach

with its restrictive assumptions is not ecologically valid (Simon 1989; Stiglitz 2012). Marketing textbooks also have not included behavioral price research insights in prescribing managerial pricing behavior. These limitations of the acceptance and use of knowledge stemming from behavioral price research is disappointing given that it is perhaps “one area that has allowed marketing to make a contribution to other fields” (Adaval 2013). The subject of “behavioral pricing” emphasizing the application of knowledge gained from behavioral “price” research to managerial practice and public policy will be the focus of the final piece in our series of essays to appraise the domain of behavioral price research.

In this first appraisal essay, we concluded by presenting a list of questions related to the phenomenon of how buyers react to price and price changes. Rather than attempting to address each of these questions, in the spirit of stimulating future building blocks of research in behavioral price, future essays in this series will relate behavioral price research to such areas as perceptions of quality and value, perceived price fairness, consumer motivation, marketing channels, consumer literacy, and pricing tactics.

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